

**WHAT IS CLAIMED IS:**

1. A cathode structure for a cathode ray tube comprising:
  - a sleeve with a built-in heater;
  - a base metal covered with an electron-emissive material, the base metal being fixed to an upper end portion of the sleeve; and
  - a holder for encompassing the sleeve, wherein H denotes a height of the cathode structure, C denotes a height of the base metal, D denotes a length of the holder, and H, C, and D satisfy the condition of  $-0.6\text{mm} \leq (H-(C+D)) \leq 0.4\text{mm}$ .
2. The cathode structure as claimed in claim 1, wherein  $(H - (C+D))$  is in the range of about  $-0.6 \text{ mm}$  to about  $0.2 \text{ mm}$ .
3. The cathode structure as claimed in claim 1, wherein a length, B, from a lower end of the base metal to a lower end of the sleeve is in the range of about  $2.5 \text{ mm}$  to about  $4.0 \text{ mm}$ .
4. The cathode structure as claimed in claim 1, wherein the height, C, of the base metal is greater than or equal to about  $0.5 \text{ mm}$ .
5. The cathode structure as claimed in claim 4, wherein the height, C, of the base metal is in the range of about  $0.6 \text{ mm}$  to about  $1.1\text{mm}$ .

6. The cathode structure as claimed in claim 1, wherein the length, D, of the holder is in the range of about 4.5 mm to about 8.0 mm.

7. The cathode structure as claimed in claim 1, wherein a length, F, from an upper end of the sleeve to a lower end of the base metal is in the range of about 0.25 mm to about 0.85 mm.

8. The cathode structure as claimed in claim 1, wherein a length, G, from an upper end of the sleeve to an upper end of the holder is in the range of about 0.4 mm to about 0.8 mm.

9. The cathode structure as claimed in claim 1, wherein a length, S, of the sleeve is in the range of about 2.9 mm to about 5.5mm.

10. The cathode structure as claimed in claim 1, wherein a difference between an inside diameter,  $D_h$ , of the holder and an outside diameter,  $D_s$ , of the sleeve, namely  $(D_h - D_s)$ , is in the range of about 0.6 mm to about 0.9 mm.

11. The cathode structure as claimed in claim 1, wherein a length of an upper portion (thickness) of the base metal is in the range of about 0.05 mm to about 0.25 mm.

12. The cathode structure as claimed in claim 1, wherein a length from a lower end of the base metal to an upper end of the sleeve, F, the length of the holder, D, and a length from the upper end of the sleeve to an upper end of the holder, G, satisfy a relation of  $G + D \geq F + D$ .

13. The cathode structure as claimed in claim 1, further comprising a strap for fixing the sleeve inside the holder.

14. The cathode structure as claimed in claim 13, wherein a height, A, of a strap welding point from a lower end of the sleeve is not larger than about 1.0 mm.

15. The cathode structure as claimed in claim 13, wherein a length, R, of the strap is in the range of about 1.9 mm to about 3.1mm.

16. The cathode structure as claimed in claim 13, wherein a ratio of a length of the strap, R, to a length of the sleeve, S, namely  $R/S$ , is in the range of about 55% to about 80%.

17. The cathode structure as claimed in claim 13, wherein a ratio of a length of the strap, R, to a length of the sleeve, S, namely  $R/S$ , is in the range of about 60 to about 80%.

18. The cathode structure as claimed in claim 13, wherein the point at which the strap is affixed to the sleeve is located at or above a distance from a lower end of the sleeve which is equal to about 1/3 of the length of the sleeve.

19. A cathode structure for a cathode ray tube comprising:  
a sleeve with a built-in heater;  
a base metal covered with an electron-emissive material, the base metal being fixed to an upper end portion of the sleeve; and  
a holder for encompassing the sleeve, wherein a length from a lower end of the base metal to an upper end of the holder is in the range of about -0.6 mm to about 0.4 mm.

20. The cathode structure as claimed in claim 19, further comprising a strap for fixing the sleeve inside the holder.

21. The cathode structure as claimed in claim 19, wherein the length from the lower end of the base metal to the upper end of the holder is in the range of about -0.6 mm to about 0.2 mm.

22. A cathode structure for a cathode ray tube comprising:  
a sleeve with a built-in heater;  
a base metal covered with an electron-emissive material, the base metal being fixed to an upper end portion of the sleeve; and

a holder for encompassing the sleeve, wherein a height of the cathode structure, H, a height of the base metal, C, and a length of the holder, D, satisfy a relation of  $H \leq C + D$ .

23. The cathode structure as claimed in claim 22, further comprising a strap for fixing the sleeve inside the holder.